PhD Project

Control of chaotic systems/Nonlinear dynamics

Sometime systems show – typically depending on parameters - chaotic behaviors. Jumping between different equilibria is one characteristic of those behaviors. To learn about the nature of chaos some fundamental research questions are discussed in the last years in the Chair SRS (Dynamics and Control) especially in combination the dynamical behavior of an elastic inverted pendulum with two stable and one unstable equilibrium. Beside modeling aspects of the overall behavior (with more than one equilibrium) aspects of differerent control approaches may be interesting to discuss. A suitable and attractive control approach for this kind of system is impulse control, which is also easy to realize, alternatively model-free, model-adaptive or model-predictive approaches can be applied.

For research in this field a highly motivated student from mathematics, phycics, an engineering discipine with strong interest and shown expertise in nonlinear dynamical systems is needed..

From the new candidate we expect that s/he is willing to become very fast an important and valuable member of our Chair.

Therefore we expect

i) a shown and strong expertise in related scientific fields to be integrated,

ii) your ability and commitment to develop and validate NEW methods and approaches, and

iii) your willingness and commitment to write scientific contributions on a world class level.

In case of interest please provide beside the usual application material (CV, grades, ...) material stating that you have strong English language skills (TOEFL IBT better than 95, IETLS better than 6.5) and a detailed and described interest ONLY in the described research fields. Your German language skills can be (if necessary) improved by language courses in parallel (for example at the Goethe Institute, Düsseldorf) (on your cost). For further information about the requirements see also the website of the Chair SRS: www.uni-due.de/srs/prospective.

About you:

Bachelor and Master degree in Electrical or Mechanical Engineering or Information science or Mathematics or Automation/Control (with strong interests in programming) (with clear related specification) necessary, deep interest in the field, excellent grades in related courses. Related and/or diverse qualifications can possibly also be very attractive.

About us:

Chair SRS (Head: Prof. Söffker) at U DuE, Germany:

With a mix of coworkers and PhD students the Chair has a strong and long tradition in supervising academic trainees. The internal organization scheme will allow an improved organization of the academic work of the PhD students in guided groups. Academic qualification includes not only the PhD topic related work but also advising coworking students (Bachelor/Master level) based on individual qualification and skills etc.

The PhD students working in the group are financed by the university or by public funding, financed by industry projects, by their home countries or by DAAD scholarships.

Be aware about the time schedule of your DAAD-application:

An application now or in September/October year 1 leads to the beginning of german language courses in May/June year 2 and start PhD research at the Chair SRS in October year 2.

In case of other application (government programs, national/university training programs):
You should be supported for more than 3,5 years. In case of support for less than 3,5 years, you should convince us based on existing international publications from the last five years.

The successful candidate is primarily directly related to:

Prof. Söffker (Scientific supervisor: Prof. Söffker)

Next steps:

1. Be aware of your national DAAD application deadline (which varies between February and November each year).

2. Contact Prof. Söffker directly by E-Mail (soeffker@uni-due.de, subject: DAAD-Appl. HMS) and send copy of CV, certificates, recommendation letters as well as a first proposal (2-3 pages) about your understanding of the intended topic, your intended working schedule, the state of the art in this field as well as the deduced definition of your project. A 'copy and paste'-strategy will disqualify you immediately.

3. Be aware about the time schedule of your application: DAAD example application in September/October year 1 leads to begin language courses in May/June year 2 and start PhD research in October year 2.

4. Joint improvement of the proposal: If the quality of the project proposal is finally fitting to the groups standard (=perfect) Prof. Söffker will invite you by writing the required acceptance letter.

5. The final decision is with the DAAD committees.

Chair of
Dynamics and Control UNIVERSITÄT DUISBURG ESSEN www.srs.uni-due.de